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Part VII

Department of Energy

Solar in Federal Buildings Demonstration Program Rules

DEPARTMENT OF ENERGY

10 CFR Part 436

[Docket No. CAS-RM-79-401]

Solar in Federal Buildings Demonstration Program Rules

AGENCY: Department of Energy.

ACTION: Notice of Final Rulemaking.

SUMMARY: The Department of Energy today establishes a new Part 436 in Title 10 of the Code of Federal Regulations for rules governing programs to conserve Federal energy use and to promote consumption of renewable energy sources under the Energy Policy and Conservation Act, as amended, Executive Order 11912, as amended, and the National Energy Conservation Policy Act. This notice inaugurates the new Part 436 by finalizing rules for the administration of the Solar in Federal Buildings Demonstration Program under Title V, Part 2, of the National Energy Conservation Policy Act. These rules set forth requirements and procedures for the submission and content of Federal agency proposals, criteria for evaluation and selection of projects to be funded, transfer of funds for approved projects, and periodic reports with respect to the maintenance and operation of active and passive solar heating and solar heating and cooling demonstration projects in Federal buildings.

EFFECTIVE DATE: November 19, 1979.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION:

I. Background

In a notice of proposed rulemaking (NOPR) published on April 2, 1979 (44 FR 19328), the Department of Energy (DOE) proposed to establish a new Part 436 in Title 10 of the Code of Federal Regulations for rules governing programs to promote energy conservation and use of renewable energy sources by Federal agencies. Specifically, the NOPR set forth proposed rules to inaugurate Part 436 by implementing the Solar in Federal Buildings Demonstration Program under Title V, Part 2, of the National Energy Conservation Policy Act. These proposed rules included provisions governing procedures for the submission and content of Federal agency proposals, criteria for evaluation and selection of projects to be funded, transfer of funds for approved projects, and periodic reports with respect to the maintenance and operation of active and passive solar hearing and solar heating and cooling demonstration projects in Federal buildings. For the reasons stated in the preamble to the NOPR, DOE concluded that although these rules are significant under Executive Order No. 12044, 43 FR 12661 (March 24, 1978), they do not have the kind of impacts which call for a regulatory analysis or an environmental impact statement under the National Environmental Policy Act of 1969, 42 U.S.C. 4321 *et. seq.* A public hearing was held on the NOPR on April 17, 1979, in Washington, D.C. and the record remained open for the submission of written comments until May 31, 1979. A major purpose of this program is to show Federal confidence in and focus public attention on proven applications of solar heating and solar heating and cooling technology which can be used in the private sector.

II. Discussion of Comments

In response to the NOPR, five persons presented oral testimony at the public hearing, and 21 written comments were received. The final rules promulgated today are a revised version of the proposed rules reflecting technical changes and changes in response to public input. The following is a discussion of the relevant issues raised by commentors which call for a DOE response. Important, general issues which arise out of comments are treated first and a discussion of comments directed at specific sections of the proposed rules follows.

A. General Issues

1. *Role of Passive Solar Energy Systems.* Several commentors expressed concern that the proposed rules tended to overemphasize "active solar energy systems" at the expense of "passive solar energy systems" and to overlook the desirability of minimizing buildings loads by using a passive solar energy system in tandem with an active one. Generally speaking, and as defined by § 436.71, "active solar energy systems" are distinguishable from "passive solar energy systems" because they rely on mechanical equipment (pumps or fans) to move heat transfer fluids or air throughout the systems. In contrast, passive solar energy systems rely on a structural design which involves natural convection, conduction and radiation. Since passive solar energy systems are often cost effective in new buildings and should be attractive to the private sector, it is vitally important for the DOE Solar in Federal Buildings Demonstration Program to give them appropriate emphasis, and to achieve this objective, certain substantive changes have been made.

In response to a specific suggestion by one commentor, DOE has revised the definition of the key term—"solar energy equipment" in proposed § 436.71. The proposed definition was: "* * * equipment which is for active or passive solar hot water heating, heating, heating and cooling including but not limited to collectors, storage devices, heat exchangers, south-facing glazing, mountings, piping, valves, gauges and contols." That definition was an elaboration of the same term that appears in the authorizing language of Title V, Part 2, of the NECPA. The words easily connote the mechanical equipment common to active solar energy systems, but do not as readily call to mind specially designed building components and materials such as thermal storage walls. DOE believes that the Congress intended that some or all of the cost of passive systems be fundable. In order to provide more clearly for funding of building components and materials designed to capture solar energy, DOE today promulgates a modified definition of the term "solar energy equipment" which reads: " 'Solar energy equipment' means building components, materials, or other items of equipment which are the means for passive or active solar heating, hot water, or heating and cooling including but not limited to collectors, storage devices, heat exchangers, south-facing glazing, mountings, piping, instrumentation, pumps, valves, guages, and controls."

DOE has also revised the selection criteria of § 436.78(c) to emphasize the desirability of taking advantage of passive solar energy systems. As revised, the section gives weight to proposed projects which take account of feasible opportunities to include such a system in the design of a building.

Finally, in response to one of the comments, DOE is also modifying the proposed forms for agency proposals which were made available in the public file. One of these forms, which is to be used by agencies submitting cost data on proposals, contained a statement to the effect that passive and process heat applications were subject to restraints due to funding limitations. The phrase "funding limitations" referred only to the overall program constraint created by limited appropriations, a constraint which applies to the funding of active solar energy systems as well as passive ones. Because the statement in question

apparently was ambiguous and is unnecessary, it has been deleted.

2. *Provisions for Energy Conservation Measures.* Some commentors suggested the need for changes to require energy conservation measures to be included as part of a proposal to install "solar energy equipment." One commentor referred to various conservation technologies to reduce consumption of scarce fossil fuel Btu's, technologies which did not involve control of insolation. Another referred to waste heat recovery and biomass. However, none of the persons commenting on this aspect of the program suggested specific language changes.

In response to these comments, DOE has modified the screening criteria of § 436.78(b) so that proposed projects will be rejected if, for the building in question, the application does not show that appropriate energy-saving changes in operation and maintenance practices and cost effective non-solar energy conservation measures to reduce building energy loads have been implemented or are scheduled and budgeted. This criterion should result in smaller, less expensive systems in many cases.

It should be noted that the proposed rules did encourage conservation actions. Proposed § 436.78(d) provided for preference in selection for "innovative and diverse applications" a term which was defined to include combinations of solar energy systems and innovative non-solar energy conservation measures.

3. *Technical Support by Other Federal Agencies.* In the past, DOE has availed itself of technical support by other Federal agencies with expertise to contribute to the administration of solar and other programs. DOE has decided to follow that practice for this program by calling upon the National Aeronautics and Space Administration (NASA) for technical support.

One of the commentors criticized a possible arrangement with NASA, arguing that DOE should be the manager of the program with responsibility for oversight and evaluation. That comment was based on the mistaken assumption that DOE intended to delegate management responsibility to NASA. In fact, DOE will be actively managing all aspects of the program including final evaluation of proposals and oversight. NASA will make recommendations to DOE and provide technical support services which cannot be obtained from any other source in the short term. This arrangement with NASA is essential to make the program operational as soon as possible.

4. *Relationship to Other Conservation and Solar Programs.* Some of the comments received by DOE in response to the NOPR indicated a lack of awareness of other programs involving a broader range of conservation and solar technologies or raised questions about the relationship of the Solar in Federal Buildings Demonstration Program to some of those other programs. As was noted at the outset, this program is primarily a market initiative intended to show Federal confidence in and to focus public attention on applications of solar heating and cooling technology which the private sector can be using. It is also intended to reduce consumption of nonrenewable fossil fuels. Other programs with similar objectives are the Federal Buildings Program to reduce building energy use on a cost effective basis, the Federal Photovoltaic Utilization Program, the Residential Energy Conservation Service Program, the Schools and Hospitals Grant Program, the Solar Heating and Cooling Demonstration Program (under the Solar Heating and Cooling Demonstration Act of 1974), and the Department of Defense Military Construction Program. To ensure that these programs are properly coordinated, DOE has instituted regularly scheduled meetings among representatives of these programs. In addition, meetings are scheduled with Federal agencies involved in significant building construction activities such as the General Services Administration so that all Federal participants can better utilize and be aware of Federal activities related to solar energy. In this manner, DOE and other Federal agencies will exchange information, avoid duplication, and improve efficiency in carrying out their respective programs.

B. Comments on Particular Sections

1. *Section 436.71—Definitions*

"Design Costs". One commentor questioned whether the definition of "design costs" included costs incurred as a result of Federal agency personnel performing the designing activity. DOE considers design costs to be fundable regardless of who specifically performs the actual design so long as it is done by qualified personnel subequent to project selection by DOE and the expenditures can be audited.

Based on DOE experience with solar demonstration programs, DOE recommends that Federal agencies utilize experienced solar design personnel in either formulating their designs or in the review of the design in order to minimize any potential problems and to draw from current solar experiences and accepted practices. In this manner, agencies can attempt to minimize significant design problems.

"Non-Fundable Costs". Several comments were submitted which dealt with the question of whether costs incurred by a Federal agency in the preparation of its proposal (sunk design costs) should be fundable. Two commentors suggested that sunk design costs should be included under the "non-fundable cost" category. However, another took a contrary viewpoint, pointing out that at least one Federal agency normally does not request design funds separate from the request for funds for the entire project. As the NECPA specifically limits financial assistance to the design, acquisition, construction and installation of a solar energy equipment, DOE has specifically placed proposal costs and sunk design costs under non-fundable costs. DOE does not believe that this feature of the program will be especially burdensome since the conduct of a detailed architectural and engineering study is not necessary for a proposal.

"Process Heat Application". The preamble to the proposed rules mentioned the possibility that an application of solar heating technology to provide process heat in a Federal building might be funded. Process heat is energy for production of goods, services, or commodities. A definition for the terms "process heat application" has been added to the rules, and a funding limit of $1,000,000 based on experience has been set for a project involving such an application.

"Passive Solar Energy Systems". One comment raised the question of whether daylighting of buildings is considered a passive solar energy system. Daylighting involves a structural feature such as a special skylight to control exposure to sunlight and to minimize internal heating and cooling loads. DOE considers that daylighting used to supply or control all or part of the heating or space heating and cooling requirements of a building may be a passive solar energy system.

"State". One commentor urged DOE to delete the definition of "State" and provide for demonstrations in foreign countries. DOE did not accept this recommendation because the program is aimed at enhancing the domestic market.

2. *Section 436.72—Procedures for Submitting Proposal.* One commentor asked whether DOE proposal evaluation procedures would be structured so that agencies could submit proposals every 60 days during the program period. The procedures will not be so structured. DOE anticipates publishing a notice

inviting further proposals in the spring of 1980.

3. *Section 436.73—Summary of Content of a Proposal.* Several comments were received regarding the information required in a proposal. A few comments suggested that DOE was creating unnecessarily complex and time consuming requirements for submitting a proposal and thereby discouraging agencies from applying. DOE is aware of the potential burden that any proposal requirement may impose on an agency. In the creation of the proposal requirements in accordance with statutory provisions, DOE attempted to minimize the proposal information required for evaluation. The forms referenced in this rule were carefully reviewed prior to the issuance of the proposed rule and also as a result of comments submittted during the comment period. DOE considers the general project information, the technical project information, and the project cost information required as a result of the statutory provisions establishing this program to be a minor burden on the agency and the minimal amount of information needed by DOE in carrying out its duties assigned by the legislation. The basic information requirements have been summarized on a form to simplify the application process. These forms do not necessitate that a complete solar energy system design be completed at the time of submission. DOE emphasizes that only conceptual information regarding the proposed systems and basic building information is required. DOE's attempt to assess the feasibility of the concept will be aimed at determining the basic validity of the agency's approach and ensuring that major issues have not been overlooked.

In conferences held in the ten DOE regions, DOE has attempted to assist Federal agency personnel in understanding and completing the information required in the forms. DOE hopes that these conferences have assisted agencies in understanding the requirements of the program. Additional technical and solar conferences will be held in the regions to assist Federal agency personnel in solar and program-related activities.

4. *Section 436.74—Required Program Information.* Several comments expressed doubts about some of the proposed agency reporting requirements applicable to the period of construction. Questions were raised as to the need for quarterly status reports, final construction status reports, reproducible drawings, design review results, acceptance testing plans, and the operation and maintenance manual. A few comments stated that these requirements would result in excessive expenses in the operation of the program. DOE is well aware of the potential expense of some of these items and has made every attempt to minimize these requirements consistent with its management responsibility. With the exception of the quarterly status report, DOE believes that anyone properly designing and constructing a solar energy system would require all of the above-mentioned items and that belief is based upon past and on going experience with solar heating and cooling demonstration projects. Insofar as the quarterly design and construction status reports are concerned, DOE considers them to be essential for its management function. DOE estimates that these reports could be done on each project in several pages including one or two charts or tables. Every attempt has been made to minimize reporting burdens, but DOE does not think that further deletions are warranted.

5. *Section 436.75—Required General Project Information.* The information requirements of proposed § 436.75 were reviewed in light of comments criticizing the rules because of burdens entailed in responding. It was decided to eliminate some of these objectionable requirements which would have yielded information of marginal value. The eliminated provisions were items, such as number of buildings in surrounding area, which were somewhat relevant to the "visibility" selection criterion which will not influence decisionmaking as heavily as the other criteria in § 436.78.

6. *Section 436.76—Technical Project Information.* A number of comments were received on particular aspects of technical project information requirements. DOE considered these comments, reviewed the potential burden involved in responding, and modified specific provisions accordingly.

Several comments proposed the introduction of additional design requirements. One comment suggested the use of natural ventilation as a prerequisite to the installation of solar energy cooling equipment. Another comment suggested that a limit be imposed on fossil fuel. Btu's to be consumed in the operation of an active solar energy system to insure that the energy consumed to operate pumps for example is not excessive. These and other specific suggestions for identifying and improving the technical aspects of individual designs are useful, and will be considered, as appropriate, in evaluating the merits of proposed projects.

One comment was received which addressed the problem of potential confusion in evaluating combined active and passive projects if no distinction is made between Btu consumption and cost figures. DOE is aware of the potential difficulty in evaluating certain types of combined solar energy systems. However, the program forms provide for separate calculation of performance and cost of active and passive solar energy systems, respectively, even if combined in a proposed project. The active and passive solar energy systems will be evaluated on their individual merits and then on their combined merits to insure proper integration.

Several commentors suggested revising provisions of the rules incorporating the National Bureau of Standard (NBS) Interim Performance Criteria and HUD Minimum Property Standards. The suggested revisions involved substitution of recent privately developed standards such as the thermal performance certification standard of the Solar Energy Industries Association (SEIA). DOE does not regard the specific standards suggested as final voluntary consensus standards and it would therefore be inappropriate to incorporate them into the rules at this time.

Another comment questions the validity of the standards DOE proposed to use and suggested that they might hamper the use of successful solar energy systems. DOE believes that the standards do in fact promote the use of reliable, commercially-available and environmentally-safe solar energy equipment and that they should not be deleted.

Another comment suggested that certain forthcoming modifications to the NBS standards be included in the final rules. Because the modifications to the standards have not yet been finalized, DOE feels that it would be inappropriate to incorporate the changes at this time.

As SEIA, NBS, and other relevant standards become final, DOE will be examining them, and, at an appropriate time, expects to publish a notice of inquiry seeking public comment on the advisability of using one or more of them in DOE programs such as the Solar in Federal Buildings Demonstration Program. Should the DOE decide to incorporate any of these standards in this program, today's final rule will be revised appropriately.

Several commentors opposed the requirement for a minimum five-year limited warranty on the solar collectors from the manufacturer and suggested that the warranty period be reduced.

They pointed out that the five-year limited warranty was inconsistent with three-year warranties usually provided by manufacturers in the heating and cooling industry, that the warranty provisions might impede the growth of the solar collector manufacturing industry, and that the additional costs incurred by solar collector manufacturers to maintain a five-year limited warranty might be passed on to the consumer. Based on the current practices with regard to the period of warranties, DOE determined that a three-year limited warranty on the solar collectors from the manufacturer would be acceptable at present. This change has been incorporated into the final rules. However, in view of the five-year warranties common to conventionally powered energy systems, DOE feels that solar consumers will eventually demand, and solar manufacturers will offer, a five-year limited warranty on the solar collectors.

An additional comment focused on the specific aspect of the warranty requirements providing for reasonable inspections on request, by installers and manufacturers at no cost to the Federal agency, to investigate complaints regarding possible defects in materials, manufacture, or installation and take expeditious corrective action. The commentor felt that the requirement was unfair and that a limit to the complaints should be inserted in the rules. DOE does not agree that a limit is appropriate, but encourages agencies to ensure that complaints are made only when a valid concern or problem exists.

One commentor urged DOE to insert a requirement for consultation with a qualified architectural or engineering firm when a detailed architectural and engineering study seems appropriate. In most instances these kinds of studies will be unnecessary in order to formulate a proposal, and in any event, the desirability of engaging firms with demonstrated qualifications at an appropriate time is obvious. DOE was not persuaded that this suggested insertion was desirable.

Another comment focused on the requirement that Federal agencies describe the method of calculation for determining the optimized solar collector area and on the preamble discussion of possible computer programs usable for this purpose. This comment urged that other acceptable computer programs be acknowledged or that the mention of government-sponsored programs be deleted. It was argued that mention of certain programs represented an implied endorsement of them and should be avoided. DOE recognizes that other solar design calculation programs are available in the public and private sectors and encourages the use of any reasonable technique. The reference to specific computer programs in the preamble was intended only as an example and not as an endorsement of any one program. Furthermore, DOE does not intend to discourage the use of alternate programs and has not specifically named any particular computer program in the rules.

7. Section 436.78—Evaluation Procedures and Criteria. Several comments were received on various aspects of the evaluation procedures and criteria. DOE considered these comments and determined that no basic changes in these procedures and criteria are necessary.

One commentor contended that the statement allowing dismissal of proposals if the cost estimates are unrealistic needs further clarification unless each proposal is to be subjected to a varying standard. The commentor offered no specific language changes. Another noted that the evaluators would need to be thoroughly familiar with the best local and agency cost data available. DOE agrees with the latter observation, but has decided that further elaboration on this provision would eliminate essential flexibility.

A number of comments addressed the proposed selection criterion of visibility. One commentor opposed the inclusion of visibility on the basis of experience which indicated that large installations tended to discourage the layman. The commentor argued that consumers would think their homes would require systems as large and as expensive. Another comment commended the provisions regarding selection criteria but expressed concern over the possibility that the visibility criterion would lead to "gold-plated," custom-built solar energy systems. One comment recommended that all Federal Buildings be eligible for DOE selection regardless of their visibility. A final comment urged that DOE accept proposals for Federal facilities not highly visible to the public due to limited access or remote locations. It is doubtful that DOE will approve projects simply because they are visible. The projects likely to be approved are those that score high when all the criteria are applied. Nevertheless, since an object of the program is to illustrate applications of solar heating and cooling technology for the public that they may want to apply to their own circumstances, visibility based on location and public access is an important consideration which should not be deleted.

Another comment suggested that some modification should be allowed in the replication criterion to account for the type of Federal buildings unique to the public sector. This suggestion has been accepted.

One comment recommended that an additional selection criterion be included: The degree to which the project is monitored to show its compatibility with the conventional energy network. The impact of solar energy systems on the conventional energy network and utility rates is a subject being considered by DOE pursuant to the President's direction to issue voluntary guidelines applicable to solar energy for the eleven rate standards established in the Public Utility Regulatory Policies Act of 1978 (Pub. L. 95–617). In light of that effort, DOE sees little to be gained by adding the suggested selection criterion and desires to avoid the drain on the program budget which the instrumentation implied by the criterion would necessitate.

Another comment recommended that some provisions be included to recognize the true value of solar energy to the nation including such benefits as minimal pollution, supplanting the use of fossil fuels, and national security or balance of payments improvements. It was suggested that the use of replacement cost pricing for the displaced conventional energy could help. This issue and others concerning economic evaluation of investments will be addressed in the forthcoming notice of final rulemaking on the life cycle costing methodology which will be applicable to this program.

Several comments were received on the relative importance of the proposed selection criteria. In the preamble of the NOPR, DOE had invited public comment on the desirability of assigning points (weighting factors) to each selection criterion. In general, the comments discussed the merits and, to a lesser degree, the relative importance of the proposed selection criteria. There were, however, no specific suggestions for assigning weights. In order to show its priorities more clearly, DOE has revised § 436.78 to include specific percentages for each selection criteria. The highest percentages have been attached to the factors which correlate best with the program objective of demonstrating proven, cost effective, commercially available solar energy equipment. DOE expects that the application of the weighted selection criteria will result in the following distribution during the first cycle of this program—

- 50% active solar hot water and space heating applications;
- 30% passive solar hot water and space heating applications;
- 10% active solar space heating and cooling applications; and
- 10% active process heat applications.

Agencies should bear these figures in mind in selecting projects to propose, but should not regard them as inflexible.

Several comments were received which were critical of the provisions for considering estimated simple payback time in evaluating proposed projects. One comment suggested that reliance solely on life cycle costing procedures would avoid unnecessary inconsistency with other building programs. Other comments claimed that estimated simple payback time does not allow for recognition and evaluation of other potential tangible benefits which accrue subsequent to payback. Simple payback is a rough measure of cost effectiveness which the NECPA requires. DOE intends to take the calculation into account in assessing the proposals, but expects to give determinative weight to life cycle costing calculations in making selections of projects for funding.

In the NOPR, DOE discussed the possibility of adding provisions to the final rules regarding cost-sharing with Federal agencies and for attaching additional points in the evaluation criteria as a means of extending program impact. One comment supported cost-sharing, while another comment noted that cost-sharing would only create complications. It was added that cost-sharing with other Federal agencies—unlike cost-sharing with private parties—would not have the advantage of extending Federal funds. Another comment considered cost sharing of questionable merit because it could discriminate against agencies with low budgets or budget problems. Despite these comments, DOE still believes that agency cost-sharing offers tremendous potential for broadening the program impact and has modified § 436.78(c) to include cost-sharing as one of the selection criteria.

One commentor urged that the program be structured to encourage participation by small business, and specifically suggested, without clearly explaining the connection, that the rule be modified to extend the 180-day period for agency submission of proposals to DOE. DOE is sympathetic to the need for special action to ensure participation of small business, but the real opportunities for encouraging that participation belong to the proposing agencies who have the procurement function under this program. A modification of the 180-day period for submitting proposals would probably not significantly advance the interests of small businesses, and in any event is not permissible because Congress established that period by law. However, DOE will advise small businesses who inquire of the names of contact persons in each agency and of developments in the program which may be of interest to them. Furthermore, DOE urges participating agencies to publicize their competitive procurements and take whatever other steps they can to reach solar small businesses and involve them in the program.

DOE requested and received comments on the advisability of rejecting project with costs exceeding the following ceilings: $500,000 for an active solar space heating, cooling, and hot water project; $300,000 for an active solar space heating and hot water project; $200,000 for an active solar hot water project; $100,000 for any passive solar space heating, cooling, or hot water project; and $500,000 for any active or passive solar energy system generating energy for consumption in an industrial-type process. DOE rationalized these proposed ceilings by pointing out that agencies could fund the balance from their own appropriations, and by saying that it was more desirable to maximize the number and diversity of projects without inhibiting proposal of reasonably sized solar energy systems. Although some commentors suggested adjustments to favor one type of system over others, none advanced documented and persuasive arguments for different numbers. Accordingly, with some adjustments based upon historic facility construction cost data, DOE is promulgating the funding ceilings suggested in the preamble to the NOPR.

8. *Section 436.79—Transfer of Funds.* A few comments were received regarding the desirability of provisions dealing with the availability of supplemental funding. One commentor argued that all feasible and/or cost-effective projects experiencing cost overruns should be funded. The criticized provisions were designed to preclude cost overruns and excessive expenditures on any one project. DOE believes that cost overruns must be discouraged, and that relaxation of the rules to provide for such overruns would have the opposite effect.

Several comments criticized proposed § 436.79 for providing for an initial transfer of funding for design costs in the amount of 6–10 percent of construction costs. One commentor argued that tying design costs to percentages of construction costs would result in biased design decisions in favor of expensive equipment, high technology, and high maintenance active solar systems. This commentor also argued that smaller projects costing below $200,000 would be discouraged because they may involve design costs far in excess of the proposed 6–10 percent range. Another commentor expressed the view that the fixing of design fees as a percentage of total system costs might result in escalation of total system costs and suggested soliciting proposals with design fees based on complexity and size of buildings and on simplicity of the solar system.

DOE proposed the 6–10 percent range because it represented an approximation of design costs based upon historic facility construction cost data, and would establish reasonable limits. DOE still believes in the concept of limits, but in order to eliminate possible bias against small projects, the range has been widened to 6–20 percent. To prevent inflated costs, DOE will review each estimate and reduce it if unjustified.

9. *Section 436.80—Reporting Requirements.* Several comments were received regarding the operation and maintenance reporting requirements. One comment argued that recurring reports should be on an annual basis only and should pertain to reliability, availability, maintainability, maintenance requirements, and cost for operating the system. Two comments opposed the reporting requirements and suggested that the requirements should be simplified with the number of reports from each agency held to a minimum. Another comment suggested the inclusion of continuous data on the microclimate surrounding each building as a partial factor governing the heating or cooling data, and the total sun and sky radiation available to the solar collectors at each building. DOE decided not to make any of the suggested changes. In most cases the general operation and maintenance information data required to be collected by the proposed rules is considered to be the minimum information that DOE considers the agencies would generate or collect for their own needs. To require collection of more data not directly related to the maintenance and operation requirements of the solar energy system would lead to excessive and expensive instrumentation which would divert funds better spent on implementing more projects.

III. Forms

In light of revisions of the rules to make technical changes and to respond

to comments, DOE has also revised the forms for submitting proposals. Federal agencies may obtain these forms by calling Mr. A. Krupnick at FTS 872–1870.

IV. Effective Date and Initial Application Period.

In the NOPR, DOE indicated that the final rules might be made effective immediately rather than 30 days from publication. DOE has decided not to follow through on this indication because the final life cycle costing rules, which are essential for Solar in Federal Building Demonstration Program, can not be issued simultaneously with today's notice and are scheduled to be published later this summer. The period for submitting applications will begin upon issuance of the final life cycle costing rules. DOE expects to commence evaluation and selection of projects 30 days from the date that the period for submitting applications begins.

(Energy Policy and Conservation Act, (42 U.S.C. 6361 *et seq.* (1970)); E.O. 11912, as amended by E.O. 12003, 42 FR 37523 (July 20, 1977); Title V of the National Energy Conservation Policy Act, (42 U.S.C. 8241 *et seq.*); Department of Energy Organization Act, (42 U.S.C. 7101, *et seq.*))

In consideration of the foregoing Chapter II, Title 10 of the Code of Federal Regulations is hereby amended by establishing Part 436, and Subpart D thereof, as set forth below.

Issued in Washington, D.C., on October 12, 1979.

Omi G. Walden,

Assistant Secretary, Conservation and Solar Energy.

PART 436—FEDERAL ENERGY MANAGEMENT AND PLANNING PROGRAMS

Sec.

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Authority: Energy Policy and Conservation Act, 42 U.S.C. 636.1; Executive Order 11912, as amended, 42 FR 37523 (July 20, 1977); National Energy Conservation Policy Act, Title V, Part 2, 42 U.S.C. 8241.

§ 436.1 Scope.

This part sets forth the rules for Federal energy management and planning programs to reduce Federal energy consumption and to promote cost-effective investments in energy-saving alternative building systems, energy-saving new building designs, and use of solar and other renewable energy sources. These rules are required or authorized under section 381(a)(2) of the Energy Policy and Conservation Act, 42 U.S.C. 6361(a)(2), section 10 of Executive Order 11912 as amended, 42 FR 37523 (July 20, 1977), or Title V of the National Energy Conservation Policy Act, 42 U.S.C. 8241.

§ 436.2 General objectives.

The objectives of Federal energy management and planning programs are—

(a) To promote the design, construction, and operation of buildings to conserve and make more efficient use of fuels and energy;

(b) To shift from use of nonrenewable to renewable energy sources;

(c) To stimulate industries and create new job opportunities for supply and servicing new or improved energy-conserving and energy-supplying systems and equipment;

(d) To promote consideration of the cost of energy consumed over the useful life of a building in addition to initial costs of construction or renovation; and

(e) To place the Federal Government, the largest energy consumer in the United States, in the forefront in implementing energy conservation measures and in promoting use of solar and other renewable energy resources.

§§ 436.3–436.69 Subparts A–C [Reserved]

Subpart D—Solar in Federal Buildings Demonstration Program

§ 436.70 Purpose and scope.

This subpart contains the rules required or authorized to be promulgated under section 523 of Title V, Part 2, of the National Energy Conservation Policy Act, 42 U.S.C. 8241, which provides for a program for Federal agencies to demonstrate the application to Federal buildings of solar heating and solar heating and cooling systems. The rules set forth procedures and requirements for the content and submission of proposals by Federal agencies, for the criteria for evaluation and selection of projects to be funded, and for the periodic reporting of data regarding maintenance and operation of solar energy systems funded under this subpart.

§ 436.71 Definitions.

"Acceptance testing plan" means a test procedure to measure the performance of solar energy system to determine if the system is operating as designed.

"Active solar energy system" means a solar heating or a solar heating and cooling system in which thermal energy from the sun is collected and transferred by pumps or fans that move heat transfer fluids or air throughout the system. (See also "passive solar energy system" in this section)

"Acquisition costs" means project acquisition costs which are fundable by DOE under this subpart, including but not limited to full purchase costs of solar energy equipment to be used exclusively for the solar energy system, and that portion, attributable to the solar energy system, of costs of equipment used as part of that system as well as for other non-solar purposes.

"Building" means any structure with a roof and walls designed for storage or human occupancy which uses energy for hot water, heating, or heating and cooling.

"Building System" means any part of the structure of a building or any energy using system contributing to energy use in a Federal building.

"Btu" means British thermal unit.

"Category" means the characterization of a Federal building in terms of the primary function performed in or by the building, including but not limited to retail, office, health, education, public service, storage, and residential functions.

"Construction costs" means project construction costs which are fundable by DOE under this subpart, including but not limited to that increment of the costs of constructing or modifying a building or site attributable to the installation of the solar energy system.

"Design costs" means project design costs which are fundable by DOE under this subpart, including but not limited to preliminary feasibility design, detailed design, analysis of a solar energy system, and preparation of drawings and specifications.

"Design review" means a meeting or series of meetings held by a Federal agency with the designer of a solar energy system to assess and document the adequacy and accuracy of the mechanical, electrical, and control portions of the solar energy system and to ensure that estimates of acquisition, construction, and installation costs are correct.

"DOE" means the Office of Conservation and Solar Energy of the Department of Energy.

"Energy conservation measure" means energy conservation measure as defined by Subpart C of this part.

"Existing Federal building" means a Federal building for which construction was completed by November 9, 1978, or for which the design cannot be feasibly modified after the effective date of this subpart.

"Federal agency" means an Executive agency as defined in section 105 of Title 5, United States Code; and each entity enumerated in paragraphs (B) through (H) of Subsection (1) of section 5721 of Title 5, United States Code.

"Federal building" means any building or other structure owned by the United States or any Federal agency, including any such structure occupied by a Federal agency under a lease-acquisition agreement under which the United States or a Federal agency will receive fee simple title under the terms of such agreement without further negotiation.

"Innovative and diverse application" means the application to a Federal building of an active or passive solar energy system in combination with a feasible, new or under-utilized energy conservation technology or renewable energy system as defined by Subpart C of this part to reduce consumption of non-renewable energy resources in that building.

"Insolation" means a rate of solar energy received per unit area.

"Installation costs" means project installation costs which are fundable by DOE under this subpart, including but not limited to the emplacement of the solar energy system and conduct of the acceptance testing plan.

"Investment costs" means the initial costs of design, acquisition, construction, and installation.

"Jurisdiction or control" means power or authority to direct, administer, or control the use or operation of a Federal building.

"Memorandum of agreement" means the internal DOE document by which funds are transferred within DOE to install solar heating and solar heating and cooling equipment in a DOE-controlled Federal building.

"New Federal building" means a Federal building for which construction was not completed prior to November 9, 1978, and the design of which can be feasibly modified after the effective date of the rule.

"Non-fundable costs" means project costs which are not fundable by DOE under this subpart, including but not limited to costs of energy conservation investments, cost of a backup system, operation and maintenance costs, administrative and managerial costs, sunk design costs, and proposal costs.

"Optimized collector area" means the collector area for a solar energy system that gives the greatest total (or annualized) net savings where net savings are determined by a life cycle cost comparison of the solar system and an alternative solar energy system.

"Passive solar energy system" means a solar energy system characterized by reliance on natural convection, conduction and radiation, and by heat collection and storage devices that are structurally integrated with the occupied space, such as storage walls, storage roof, greenhouse, atrium or sunspace, thermosyphon hot water system, reflector assemblies, shading devices or reflective surfaces or glazings.

"Process heat application" means the application of solar heating technology in the production of goods, services, or commodities in a Federal building.

"Project" means specific actions to accomplish the design, acquisition, construction and installation of a solar energy system in a Federal building.

"Proposal" means an application by a Federal agency under this subpart requesting funding for one or more projects.

"Replication" means the extent to which a Federal building is representative of a significant number of existing or new buildings in the public or private sector, by category or design.

"Retrofit" means the installation of an alternative building system as defined by Subpart A of this part in an existing Federal building.

"Solar collector" means a device or structure specifically designed for receipt of solar radiation, conversion of the solar radiation to useful heat;

"Solar energy equipment" means building components, materials, or other items of equipment which are the means for active or passive solar hot water heating, heating, or heating and cooling including but not limited to collectors, storage devices, heat exchangers, south-facing glazing, mountings, piping, instrumentation, pumps, valves, gauges and controls.

"Solar energy system" means the assembly or structual integration of solar energy equipment, according to a design, for the purpose of supplying all or part of the hot water, heating, or heating and cooling requirements of a Federal building by the use of solar collectors.

"Solar heating" means, with respect to any Federal building, the use of solar energy to meet all or part of the heating needs of such building (including hot water) or all or part of the needs of such building for hot water.

"Solar heating and cooling" means, with respect to any Federal building, the use of solar energy to provide all or part of the heating needs of such building (including hot water) and all or part of the cooling needs of such building, or all or part of the needs of such building for hot water.

"State" means a State, the District of Columbia, Puerto Rico or any territory or possession of the United States.

§ 436.72 Procedures for submitting a proposal.

(a) Any Federal agency that has or will have jurisdiction or control over a Federal building in a State may submit a proposal under this subpart with respect to such a building. Initial proposals are due on or before 180 days from the date of issuance of subpart A of this part. Subsequent proposals may be submitted only upon notice of invitation by DOE in the **Federal Register.**

(b) An original of each proposal, signed by the head of the submitting Federal agency, or a designated Assistant Secretary or Assistant Administrator, and four copies shall be submitted to the Department of Energy, Office of Conservation and Solar Energy, Attn: Solar in Federal Buildings Program, Washington, D.C. 20585.

§ 436.73 Summary of content of a proposal.

A proposal, with a table of contents and pages numbered consecutively, shall contain the program information required under § 436.74, and for each project—(a) The general project information required under § 436.75;

(b) The technical project information required under § 436.76; and

(c) The project cost information required under § 436.77.

§ 436.74 Required program information.

A proposal shall contain—(a) The address and telephone number of the Assistant Secretary or Assistant Administrator responsible for implementation of a proposal approved under this subpart;

(b) The responsibilities with respect to projects of headquarters, regional, and field offices;

(c) Procedures for monitoring project expenditures;

(d) A plan for quarterly status reports beginning 45 days after transfer of design funds under § 436.79 which—

(1) Identifies individual milestone schedules for each project, including—

(i) Completion of the design, acquisition, construction and installation of each project;

(ii) Design reviews;

(iii) Award of major solar energy system subcontracts;

(iv) Acceptance testing plan; and

(v) Planned publicity, if any;

(2) Describes progress toward completion of each project;

(3) Identifies on a form provided by DOE all costs incurred during the reporting period for each project and any current or projected revisions to estimated investment costs for each project; and

(4) Describes any significant problems or delays in meeting the milestone schedule of any project during the reporting period and actions proposed or implemented to solve the problems, including any necessary revision of the schedule;

(e) An assurance that a final construction status report will be submitted forty-five days after the completion of an acceptance testing plan, which contains the following—

(1) A table of contents;

(2) A description of the completed solar energy system;

(3) Total costs on a DOE form, of the solar energy system, as constructed;

(4) A summary of any significant problems encountered in project completion;

(5) A summary of the acceptance testing plan;

(6) A summary of the results of the acceptance testing plan;

(7) Photographs of the solar energy system;

(8) A set of reproducible design and installation drawings of the solar energy system, as constructed; and

(9) A statement setting forth the extent to which the Federal agency has complied with the criteria and standards set forth in § 436.76(b) (2) and (3);

(f) A statement showing the extent, if any, to which the project represents an innovative and diverse application and identifying its geographic location;

(g) A statement setting forth the location of project records; and

(h) An assurance that complete records maintained for review of project expenditures shall be available for inspection by the DOE at reasonable times.

§ 436.75 Required general project information.

(a) Each proposal submitted under this subpart shall list the Federal buildings in which projects are proposed to be implemented, distinguishing between existing Federal buildings and new Federal buildings;

(b) For each Federal building listed under paragraph (a) of this section, the agency shall provide the following general information—(1) The street address, if known;

(2) The city, county and state;

(3) The name, address and telephone number of the project contact person, located at or adjacent to the building site, who is responsible for a solar energy system proposed for installation under this subpart;

(4) A description of the Federal building in terms of its category;

(5) Photographs taken from the Federal building, or site, looking east, south and west;

(6) Estimated or actual, if available, number of building occupants;

(7) Number of visitors annually, if known;

(8) Type of transportation route from which the Federal building is clearly visible;

(9) Types of planned project publicity;

(10) Size and location of closest city or town;

(11) Planned or implemented energy-saving changes in operation and maintenance procedures and cost effective non-solar energy conservation measures; and

(12) Other relevant location or design factors.

§ 436.76 Required technical project information.

(a) With respect to each active and passive solar energy system proposed for a Federal building listed under § 436.75 and assuming, in the case of an existing Federal building, that energy-saving changes in operation and maintenance procedures and cost effective non-solar energy conservation measures are complete, the following technical information shall be provided—

(1) Either a completed design, ready for construction in an architectural and engineering report or basic building and solar energy system design information on forms provided by DOE, with an attached schematic rendering of the design;

(2) The method of calculation used or to be used in calculating the optimized solar collector area; and

(3) An assurance that the Federal agency will—(i) Perform and record the results of all design reviews prior to construction;

(ii) Maintain a current set of solar energy system design and installation drawings;

(iii) Obtain and implement an operation and maintenance manual suitable for use by maintenance personnel;

(iv) Obtain and implement an acceptance testing plan including data collection requirements to determine that—

(A) Each major component of the solar energy system is installed and operating as designed;

(B) The solar energy system is balanced to conform as closely as practicable to the design performance specifications; and

(C) Solar energy system data is recorded during acceptance testing, along with the date, time and individual(s) performing the test; and

(v) Provide three copies of the information referred to in § 436.76(a)(3) as soon as reasonably possible after it is obtained.

(b) With respect to each active solar energy system proposed for a Federal building, and assuming in the case of an existing Federal building, that energy-saving changes in operation and maintenance procedures and cost effective non-solar energy conservation measures are complete, the following technical information shall be provided—

(1) A statement setting forth whether the proposed solar collector type is flat plate, evacuated tube, concentrator, or other type, as well as any limiting design characteristics;

(2) An assurance that the system will be designed and constructed to comply with the *Interim Performance Criteria for Solar Heating and Cooling Systems in Commercial Buildings* (1187 NBS INT. REP (1976)), or, with the HUD *Intermediate Minimum Property Standards for Solar Heating and Domestic Hot Water Systems,* (in residential buildings) (4930.2, HUD INT. MPS SUPP. (1977)), or an explanation of any reasons for exception from any part of these criteria or standards;

(3) An assurance that solar collectors will be selected taking into account—

(i) Solar collector thermal performance data collected under ASHRAE 93–77; and

(ii) Thirty-day no-flow solar collector degradation test data recorded in accordance with the procedures identified in 1305A (7.2) NBS INT. REP. (1978), or an explanation of any reasons for exception from these procedures; and

(4) An assurance that each proposed project will have—

(i) A one-year warranty from the installer, commencing with the date upon which installation is completed—

(A) Against failure of the solar energy system by a defect in materials, manufacture, or installation;

(B) Covering full costs of parts, labor, and replacement and installation at the site; and

(C) Providing for reasonable inspections on request, at no cost to the Federal agency, to investigation complaints, and take expeditious corrective action; and

(ii) A three-year warranty from the manufacturer, with respect to solar collectors, commencing with the date upon which installation is completed—

(A) Against defects in materials or manufacture and covering at least the costs of all parts delivered to the site; and

(B) Providing for reasonable inspections on request, at no cost to the Federal agency, to investigate complaints, and take expeditious corrective action.

§ 436.77 Required project cost information.

For each Federal building listed under § 436.75, and assuming, in the case of an existing Federal building, that energy-saving changes in operation and maintenance procedures and cost effective non-solar energy conservation measures are complete, the following cost information shall be provided on DOE forms or in architectural and engineering report.

(a) Estimated simple payback time, based on a comparison of the estimated costs of a proposed solar energy system with the estimated costs of a conventional non-solar energy system to determine the number of years required for the cumulative value of net differences in future energy cost savings to equal investment costs without regard to discount rates or future fuel price increases;

(b) Net savings, calculated in accordance with Subpart A of this part, based on a comparison of the estimated costs of a proposed solar energy system with the estimated costs of a conventional non-solar energy system;

(c) Total estimated costs to DOE, as designed; and

(d) Total costs of the solar energy system.

§ 436.78 Evaluation procedures and criteria.

(a) Each project proposal shall be reviewed preliminarily to determine whether it meets the requirements of § 436.72 and §§ 436.74 through 436.77, inclusive. If a proposal does not meet these requirements, the proposal may be returned with a written statement of deficiencies. If deemed appropriate, additional time to cure deficiencies may be allowed.

(b) Any project for which there is complete information under §§ 436.75–436.77 shall be rejected with a written statement of deficiencies if—(1) Adequate energy-saving changes in operation and maintenance procedures and cost effective non-solar energy conservation measures are neither implemented nor scheduled and budgeted;

(2) The design is infeasible;

(3) The cost estimates are unrealistic; or

(4) The project costs to be funded under this subpart exceed the following funding ceilings—

(i) $550,000 for an active solar space heating, cooling and hot water application;

(ii) $350,000 for an active solar space heating and hot water application;

(iii) $240,000 for an active solar hot water application;

(iv) $120,000 for any passive solar space heating, cooling, or hot water application and

(v) $1,000,000 for any solar process heat application; or

(5) The explanations of exceptions proposed under § 436.76(b)(2) and (b)(3) are deemed by DOE to be unreasonable.

(c) Selection among projects, which are not rejected under paragraphs (a) and (b) of this section, shall be based on the following criteria in accordance with the weight assigned to each—

(1) 20 points for cost effectiveness in comparison to other proposed similar projects and excess cost, if any, in comparison to the conventional non-solar energy system which minimizes the estimated life cycle cost of the Federal building;

(2) 20 points for the extent of cost sharing offered by the Federal agency;

(3) 15 points for the extent of replication;

(4) 15 points for the proximity to areas which have potential for development as a private sector market for solar energy equipment;

(5) 15 points for the extent to which the proposed project takes account of feasible opportunities to include passive solar applications;

(6) 5 points for the extent of visibility and accessibility to the public;

(7) 5 points for the extent to which the proposed project represents an innovative and diverse application; and

(8) 5 points for the geographical location in regard to other proposed projects.

(d) Each evaluation under paragraphs (b) and (c) of this section shall be in writing and shall be made available to the proposing Federal agency, or the public upon request.

§ 436.79 Transfer of funds.

(a) When a project is selected under § 436.78, the Federal agency shall be notified in writing of such selection, and funds shall be transferred, pursuant to interagency agreement or a memorandum of agreement, solely for design costs in the amount of approximately 6 to 20 percent of the total estimated solar energy system costs as determined by DOE.

(b) Upon substantial completion of a design review acceptable to DOE, total estimated costs for acquisition, construction, and installation shall be transferred pursuant to interagency agreement or memorandum of agreement.

(c) Prior to transfer of funds under paragraph (b) of this section, projects which are determined to be substantially inconsistent with the data contained in the initial proposal or are determined to be otherwise infeasible are subject ot cancellation by DOE.

(d) Except as provided in paragraphs (e) and (f) of this section, DOE shall not provide any funds for a project in excess of the funds transferred under paragraphs (a) and (b) of this section.

(e) Subsequent to bid opening by a Federal agency, and prior to contract award, DOE may in its discretion commit to transfer or transfer supplemental funds upon notification by the Federal agency that the lowest acceptable bid received by the time of bid opening exceeds the amount of funds transferred under paragraph (b) of this section. In no event shall DOE transfer supplemental funds under this subsection in excess of 25% of the funds transferred under paragraph (b). A complete record of the bid opening shall be maintained by the Federal agency, and made available for review by DOE upon request, prior to the transfer of supplemental funds under this paragraph. If the supplemental funds necessary to award a contract are not provided by the DOE, the Federal agency shall either fund the excess from its budget, or reformulate the design of the project in a manner acceptable to DOE, or cancel the project and transfer back to DOE the funds transferred under paragraph (b) of this section, as well as any unexpended funds transferred under paragraph (a) of this section. Any interagency agreement or memorandum of agreement transferring funds under these rules shall specifically provide for compliance with this subsection.

(f) Subsequent to the award of a construction contract, DOE may in its discretion transfer additional supplemental funds if it has received a timely written application for such funds signed by an assistant secretary, assistant administrator, or other senior policymaking official of the Federal agency and a written report of an audit acceptable to DOE showing that there is

a need for additional funding which was caused by extraordinary circumstances beyond the control of the Federal agency and which could not reasonably have been foreseen.

§ 436.80 Operation and maintenance reports.

Commencing within 60 days of completion of the acceptance testing plan, and continuing on a quarterly basis for the first year of operation and on an annual basis thereafter for a total of three operating years, the Federal agency shall submit on a project by project basis, the following information—

(a) Data recorded on a monthly basis from installed instrumentation for—

(1) The total amount of solar generated Btu's transferred into storage, where applicable;

(2) The total amounts of solar generated Btu's consumed in each building for hot water, heating, or cooling, respectively; and

(3) The estimated, or actual, if available, energy savings by fuel type and costs savings for hot water, heating, or heating and cooling; and

(b) Solar energy system data and information for—

(1) All operating and maintenance actions performed which have a potential significant impact on the cost, performance, or safety of the solar energy system or components, or are indicative of operating or maintenance problems which might affect the performance and operation of other solar energy systems. Information submitted must include—

(i) A complete description of the action performed;

(ii) The solar energy equipment and component involved;

(iii) The resulting cost; and

(iv) The corrective action taken; and

(2) Monthly cost estimates of all normal and significant operating and maintenance actions required to keep the solar energy system in operating condition. Specific routine actions need only be reported based on a monthly accumulation of their actual or estimated costs.

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